vanishing lines and points, by means of which the true place, on the picture, of any possible original point, may be found, and, by consequence, any line or superficies also.

Perspective has not committed the error, as has been asserted, of supposing that its laws, as a science, should only commence with the picture; and all who understand the art know well that any line represented in a picture is only a portion of a more extended line; that perspective makes the tour of creation, takes cognizance of all lines, planes, and solids, however extended, and can truly represent any.

With respect to the great celestial circles, the eye being situated in their plane, whether they be horizontal, vertical, or oblique, and equally distant from every point of their circumference, their visual representation must be by straight lines; but lines parallel to the horizon, and infinitely extended, vanish into it in points 180 degrees asunder; and this vanishing is common to the parallels of the other great circles, both perpendicular and inclined; and the eye not being situated in the planes of these parallels, they are visually curves. But any reasoning upon the laws of appearances, with respect to the circles of the heavens, whether greater or lesser, will be but little illustrative of the nature of perspective; and no result of such reasoning could affect its truth. Perspective has regard only (so far as producing the picture is concerned) to the laws of projection, and its province is the projection of lines, planes, and solids, on a flat surface; and whatever may be the deviation of the picture from the true natural appearance, all is made right, as regards the final issue, by the operation of those very laws, in viewing the picture, which are said to be broken; and a true image is, in the end, delineated on the retina of the eye.

For, let us suppose the front of a building some three or four hundred feet in length, and sixty or seventy in height, on level ground, crowned by a cornice perfectly horizontal, and entirely unbroken from end to end; this cornice will be its sky line, or terminal member to the eye. Let it be required to make a drawing of this front, by the rules of parallel perspective, supposing the spectator placed opposite its centre, and at such distance as to view the whole under an angle of about sixty degrees. The terminal member, or cornice, in this drawing will be a straight line, and parallel to the horizon. Now, we need not that one should come from the grave to tell us that this is not the true appearance of this cornice to the eye. It is not its visual representation, but it is its true scenographic or perspective representation on the plane of the picture. The cornice of the original building does not appear to the eye as a straight line (it could only so appear in the case of a crescent, with the eye placed in the centre of the arc). But, let this picture be hung up on a wall, and let a spectator place his eye opposite its centre, at the proper point of view, and he will, from it, have depicted on the retina of his eye (making due allowance of course for the imperfection of all manual operations) a true representation of the original building; for this representation of it has, if I may so speak, put itself in perspective to the eye; being seen under precisely the same condition as the original, it is evident it would present a distorted view to the eye, if its lines had undergone any change in their perspective representation. Now, as, in the original, the extremities of the building appear lower than the centre, so do they also in the picture, by an operation of the self-same optic law, that primary law by which objects decrease in size in proportion to their distance from the eye; and, to use perspective parlance, the pyramid of visual rays from the original to the eye, and that from the representation, are *similar*, and the apparent height of the extremities of the building, both in nature and in the picture, are to the height of the centre inversely as their distances from the eye. The line, therefore, of the cornice, though drawn straight upon the picture, appears curved, just as it does in nature. Under exactly the same circumstances as the original, it must obey the same laws; and if the plane of the picture extended infinitely on either hand, these lines, produced on it, would vanish in the horizon. A tightened cord placed between the eye and the cornice of this building, in the same plane with it, can prove nothing to the contrary, for, being in precisely the same position with respect to the eye as the cornice, it will become visually a curve, and decline too.

The same principle of illustration as that used above, will apply to any view parallel to the picture, whether it be the interior of a cathedral, or an exterior colonnade. In viewing the latter, it is evident that the columns will decrease in apparent height and diameter as they recede from the eye; but they must not be so represented in a picture, for the reasons before given; their due diminution is provided for by the laws of our sight operating whilst the picture is viewed, provided the spectator place himself at a proper point of distance and position. Now, there is a point of sight for every picture, and only one point, and every picture must be viewed from that point. It may be a historical subject, and consist of a group of figures, or of one figure, no matter which: that group, or that single figure, will have a distorted appearance, and a false impression of it will be conveyed to the sense of sight, unless viewed from the proper point. Even for a portrait there is but one point: the spectator must place himself in the same position with respect to the picture, as the artist occupied with respect to the person while painting him. It must be observed that the point of view from which a picture is taken should, in the first place, be at a proper distance; in other words, the view should be limited to somewhere about sixty deg. This is required not by a law of perspective, indicating any deficiency in the science or system adopted, but by the limit of vision, a law of nature herself, which does not permit us conveniently to see a much larger extent.

With regard to the vertical lines of a building or other object, it is evident that as the horizontal lines above the eye decline visually towards points on the horizon, so these, if not in the centre of the picture, must apparently incline towards the zenith, and are similarly curved; but for the reasons before addduced in reference to the horizontal lines, they must not be so drawn in the picture.

So far, therefore, from a drawing, by the hand and eye, being a true test of perspective, it must be understood that such representations cannot, viewed from whatever point, correctly convey an image of its original. This mode of representation, applied to edifices occupying a large portion of the picture, or seen under a large angle, would be sensibly erroneous; though in objects on a smaller scale, as in the case of landscape sketches, it may be sufficiently correct. When a building is to be represented on a scale of any magnitude, the rules of perspective must be called in, for it could not be correctly done by the hand and eye. By the latter method its true appearance would be delineated on the picture, but that representation, the operation of the law of optics would distort to the eye, and a false impression would be conveyed. The representation of objects by the hand and eye is not their projection on a plane, such as the picture, but on a sphere; and it is the projection on a sphere that can alone agree with true appearance or optical representation. A true projection may be made of an original object upon a surface of any species,—a surface curved to any of the conic sections; but the projection in perspective is on a plane, and it must of necessity differ from the projection on a sphere. Let lines be imagined or drawn representing these two media of projection. The line representing the plane of the picture will be a tangent to the arc which represents the segment of the sphere. Let the eye be supposed in its proper place, that is to say, in the centre of the latter; now, the difference between the projection of any object on the plane of the picture, and its visual appearance, is as the difference between that portion of the tangent intercepted by the radii forming the angle under which the object is seen, and the subtense of that angle or chord of its arc. It is obvious that the difference increases as the object recedes from the point of contact of the two surfaces of projection; but it is also obvious that the subtense or chord, and that portion of the tangent, must visually coincide to the eye, placed as supposed, which is its true position. The picture, in short, can be considered only as instrumental to the ultimate end of, by an artificial process, conveying to the eye the true appearance of objects in nature Perspective has only to do with the production of the picture, which is a projection of these objects, and its laws are so framed, that the picture drawn by them, and viewed at the proper point of distance, will unfailingly answer this end. Perspective has nothing to do with these objects, but to give a true projection of them on this plane; and this projection or representation, when viewed aright, yields to the eye a true representation of its original in nature.

I cordially agree with the objector, that, to obtain a true delineation of nature, is a point of the highest importance: "our sight," to quote a great English essayist, "is the most perfect and most delightful of all our senses; it fills the mind with the largest variety of ideas, converses with its objects at the greatest distance, and continues the longest in action without being tired or satiated with its proper enjoyments." And it is proportionably important that the result, upon the mind, of its activity, should be characterised by truth, whether it be occupied by visible objects, or by their representation in pictorial art: particularly that its laws be understood as far as they are required in the latter,—that art that can administer to more refined delight than even nature herself,—which furnishes the mind with some of its loftiest ideas, and contributes to the highest pleasures of the imagination. This point I cordially concede, but must maintain, nevertheless, that nature can be truly represented, and *is* truly represented, by the system of perspective as at present practised; and that it could be truly represented by no other system, without changing the perspective medium, an alternative which I think none will gravely propose.

I admit that few practical sciences are more imperfectly understood. We see in many engraved illustrations of architecture, and in paintings too, not only by old masters, but also by those of the present day, though well managed with respect to the higher qualities of art,—for want of this knowledge, so ill drawn as to seem almost burlesques on their originals. By many otherwise clever artists now living, perspective is evidently but little understood; and by some of the old masters it was, probably, not understood at all. But are there not illustrations of architecture, by artists of the day, so drawn as to bear the impress of truth in this respect, as well as in every other? Is there any defect of the kind observable, for instance, in the landscapes of Turner, or in the Egyptian views and continental cathedrals of Roberts?

It is, in short, from an imperfect knowledge of it, from ignorance of its true nature, that the doubts and difficulties complained of arise. I believe that no man that thoroughly understood perspective ever expressed the opinion that it was not true. I believe also, that, by using it aright, the ultimatum is obtained, that it is entirely true, and requires no innovation or revision; and that, based on propositions which admit of mathematical demonstration, it can only be found false when the geometry of the Greeks is exploded.

S. HUGGINS.

GRATUITOUS SERVICES OF ARCHITECTS.—There has been much written of late on the subject of the architect's commission. I would now wish to call attention to another subject, which is almost as bad as an architect offering to execute works for 3 per cent., I allude to a professional man agreeing to furnish designs, specification, estimates, and superintendence, gratuitously, with the prospect or promise of such an offer leading to future business or commissions. This course is unjust in every sense of the word. It is unjust to those in the profession, and it is an act of injustice towards the party from whom such an offer is extracted. If a building is to be erected either for a charitable purpose, or otherwise, let me ask can the builder afford, or could it be expected that he could afford, to erect the building free of cost? Is it expected that the solicitor should draw up the agreements, &c., free of expense? Can the doctor afford to administer his advice or his medicines gratuitously? Can the clergyman afford his services gratuitously, or the tradesman his goods, &c.?

A. S.

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